(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 292 990 B1**

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **01.02.95**

(51) Int. Cl.[6]: **C07D 213/82**, C07D 213/89, C07D 215/54, C07D 221/04, A01N 43/40, A01N 43/42

(21) Application number: **88108501.3**

(22) Date of filing: **27.05.88**

The file contains technical information submitted after the application was filed and not included in this specification

(54) **4-Halopyridine-3-carboxamide compounds and herbicidal composition thereof.**

(30) Priority: **29.05.87 JP 131696/87**
16.10.87 JP 262333/87

(43) Date of publication of application:
30.11.88 Bulletin 88/48

(45) Publication of the grant of the patent:
01.02.95 Bulletin 95/05

(84) Designated Contracting States:
DE FR GB

(56) References cited:
EP-A- 0 044 262
DE-A- 2 417 216

PESTIC. SCI. (1991) 32, PP.73-84

(73) Proprietor: **DAICEL CHEMICAL INDUSTRIES, LTD.**
No. 1-Banchi, Teppo-cho
Sakai-shi
Osaka-fu 590 (JP)

(72) Inventor: **Yagihara, Hiroshi**
1177-5, Matogata
Matogata-cho
Himeji-shi
Hyogo-ken (JP)
Inventor: **Goto, Yukihisa**
1903-3, Okihama
Aboshi-ku
Himeji-shi
Hyogo-ken (JP)
Inventor: **Masamoto, Kazuhisa**
125, Oaza-nakagawa
Arai-shi
Nigata-ken (JP)
Inventor: **Morishima, Yasuo**
3-6-11, Tsutsujigaoka
Tarumi-ku
Kobe-shi
Hyogo-ken (JP)
Inventor: **Osabe, Hirokazu**
940, Shinzaike
Aboshi-ku
Himeji-shi
Hyogo-ken (JP)

EP 0 292 990 B1

(74) Representative: **Kraus, Walter, Dr. et al**
Patentanwälte Kraus, Weisert & Partner
Thomas-Wimmer-Ring 15
D-80539 München (DE)

Description

This invention relates to novel 4-halopyridine-3-carboxamide compounds and herbicidal composition thereof.

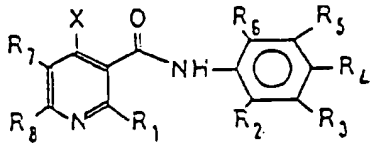
Certain compounds belonging to 4-halopyridinecarboxamides have been mentioned in some literatures.

That is, DE-A-2417216 disclosed 4-chloro-N-phenyl-3-pyridinecarboxamide hydrochloride as bactericidal agent. Bala, Marian et al. (Chem. Abst., 88, 6686s) reported 4-chloro-N, 2-diphenyl-3-quinolinecarboxamide, 4-chloro-N-methyl-N, 2-diphenyl-3-quinolinecarboxamide, 4-chloro-N-(4-methylphenyl)-2-phenyl-3-quinolinecarboxamide, 4-chloro-N-(4-methoxyphenyl)-2-phenyl-3-quinolinecarboxamide and 4-chloro-N-(4-N',N'-dimethylaminophenyl)-2-phenyl-3-quinolinecarboxamide which were prepared by the reaction of quinoline-3-carbonylchloride compounds with amines, and were confirmed with ultraviolet and infrared spectrum thereof. 4-Chloro-N, 2-diphenyl-3-quinolinecarboxamide was also obtained by a method similar to that disclosed by Bala, Marian et al. (Zankowska-Jasinsca, Wanda et al, Chem. Abst., 83, 58620 g).Nagano (Chem. Abst., 55, 11413 g) reported the preparation of 4-chloro-N-phenyl-3-quinolinecarboxamide, 4-chloro-N-(4-ethoxyphenyl)-3-quinolinecarboxamide and 4-chloro-N-(4-methoxyphenyl)-3-quinolinecarboxamide by treating the corresponding 4-hydroxy compounds with phosphorus oxychloride.

US-4,312,870 and EP-A-168350 described 4-chloro-N-(4-chlorophenyl)-3-quinolinecarboxamide and 4-chloro-N-(4-chlorophenyl)-5,6,7,8-tetrahydro-3-quinolinecarboxamide as the raw materials for pyrazoloquinoline compounds having attractic activity. EP-A-0 112 262, EP-A-0 069 033 and EP-A-44 262 disclosed certain 3-carbamoylpyridine derivatives possessing herbicidal effect. However, all the compounds disclosed in the above mentioned EP-A-0 112 262 and EP-A-0 069 033 have N-benzylcarbamoyl group at the 3rd position of pyridine ring, while those disclosed in the above mentioned EP-A-44 262 are N-phenyl-3-pyridinecarboxamide derivatives in which however the 4th position of pyridine ring is hydrogen atom and the 5th position is substituted by cyano, carboxyl or a lower alkoxycarbonyl. Therefore, the compounds disclosed in the above mentioned three European Patent Applications structually different from the compounds of the formula (I) as mentioned below.

As discussed above, there were no reports on the 4-halopyridine-3-carboxamide compounds of the formula (I), together with no suggestion on their herbicidal activities.

This invention provides 4-halo-3-pyridinecarboxamide compounds of the formula (I):



(I)

wherein R_1 is a C_{1-5} alkyl or a phenyl optionally substituted by a halogen,

R_2-R_6 is a C_{1-5} alkyl, a hydrogen or a halogen,

R_7 is a hydrogen, a halogen, a C_{1-5} alkyl, a C_{2-6} alkenyl, a C_{2-6} alkynyl or a phenyl,

R_8 is a C_{1-5} alkyl, or R_7 and R_8 may be combined to form a group of - $(CH_2)_m$ - (m is 3 or 4),

X is a halogen.

The term "C_{1-5} alkyl" means an alkyl group containing 1 - 5 carbon atoms. Specifically, the C_{1-5} alkyl group may be methyl, ethyl, propyl, isopropyl, butyl, isobutyl, pentyl or isopentyl.

Also, the term C_{2-6} alkenyl group" or "C_{2-6} alkynyl group" in this invention means a group containing 2 - 6 carbon atoms. Specifically, the C_{2-6} alkenyl or C_{2-6} alkynyl group may be vinyl, allyl, 1-propenyl, isopropenyl, 2-butenyl, 3-butenyl, 2-methyl-2-propenyl, 3-methyl-2-butenyl, 1,3-butadienyl, 2-pentenyl, 1,4-pentadienyl, 1,6-heptadienyl, 1-hexenyl, ethynyl or 2-propynyl.

Examples of the halogen atoms include chlorine, bromine, fluorine or iodine.

Similarly, the phenyl in the phenyl which may be substituted may be substituted by a halogen atom.

The compounds (I) of this invention are useful as herbicide for paddy field, vegetable field (field farm), fruits garden, meadow, lawn, woods and other field of grass.

For herbicidal applications, the compounds of the present invention may be used as they are, but are generally formulated into herbicidal compositions such as wettable powders, granules or emulsifiable concentrates, in admixture with solid carriers, liquid carriers, surfactants and/or other adjuvants for preparations.

These compositions may preferably contain 10 - 80% for wettable powders, 0.1 - 20% for granules, or 10 - 50% for emulsifiable concentrates by weight of the active compound of this invention.

Examples of the solid carriers to be used for the compositions include fine powders or granules such as kaolinites, bentonites, clays, talcs, silicas, zeolite, pyrophilites, synthetic oxygen-containing silicones or calcium carbonate. Examples of the liquid carriers include aromatic hydrocarbons such as xylene or methylnaphthalene; alcohols such as ethanol, isopropanol, ethylene glycol or methylcellusolve; ketones such as acetone, isophorone or cyclohexanone; vegetable oils such as soya bean oil or cotton oil; or dimethylformamide, diemthylsulfoxide, acetonitrile or water.

Surfactants for dispersing or emulsifying are generally used with the liquid compositions. Their examples include nonionic types such as polyoxyethylene alkyl ethers, polyoxyethylene alkylaryl ethers, polyoxyethylene fatty acid esters, sorbitan fatty acid esters, polyoxyethylene sorbitan fatty acid esters or polyoxyethylene polyoxypropylene block-polymer; or anionic types such as alkylsulfonates, alkylaryl sulfonates or polyloxyethylene alkylsulfates.

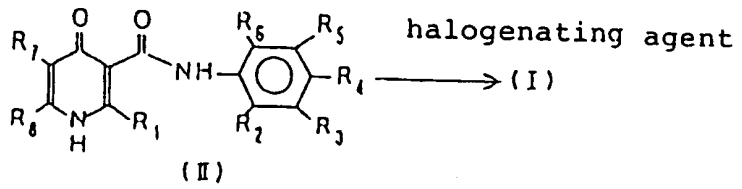
Examples of the adjuvants include lignine sulfates, arginates, polyacrylates, polyvinyl alcohol, vegetable gums, carboxymethylcellulose (CMC) or hydroxyethylcellulose (HEC).

Also, the compounds of this invention can be, when needed, used in admixutre with insecticides, acaricides, nematicides, bactericides, other herbicides, plant growth regulators, fertilizers or soil conditioners.

Dosage of the herbicidal compositions is generally 0.1 - 50 g by weight of the active compound, per are, although it varies depending upon places methods and kinds of plants.

The compounds of the formula (I) in this invention may be prepared by any of the following methods.

Method A



R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 of the formula (II) are the same as those in the formula (I).

This method comprises reacting a 1,4-dihydro-4-oxo-3-pyridine carboxamide compound of the general formula (II) with a halogenating agent in the presence or absence of an appropriate solvent (e.g., toluene, benzene or mesitylene) under heating (e.g., at 50 - 200 °C). The halogenating agent includes phosphorus oxychloride, posphorus pentachloride, phosphorus oxybromide, phosphorus pentabromide, phosphorus tribromide. This method is suitable to obtain a compound of the formula (I), wherein X is bromine or chlorine atom.

Method B

This method is a halogen-exchange reaction and comprises reacting a compound of the general formula (I) with an alkali halide, transition metal halide or metal halide in the presence or absence of an appropriate solvent (e.g., acetone, 2-butanone, N,N-dimethylformamide, dimethylsulfoxide, sulfolane or benzonitrile) at a temperature of over room temperature to a refluxing point of solvent to be used and if necessary under pressure. This method may be used to obtain especially a compound of formula (I) wherein X is fluorine or iodine.

The compounds of the formula (I) may form the corresponding salts with inorganic acids such as hydrochloric acid, sulfuric acid or phosphoric acid, or organic acids such as methanesulfonic acid, p-toluenesulfonic acid, trifluoroacetic acid, succinic acid, oxalic acid or tartaric acid. Also, they may form the corresponding pyridinium salts with halogen compounds such as methyl iodide, or sulfonates such as methyl methanesulfonate.

The formation of such salts as mentioned can be conducted in accordance with a conventional method. It should be understood that the salts as mentioned above are included in the invention.

Furthermore, interesting compounds in addition to the compounds shown in the examples are as follows;

4-bromo-N-(2,6-diethylphenyl)-2,5,6-trimethyl-3-pyridinecarboxamide,
4-bromo-5-ethyl-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
4-bromo-N-(2,6-diethylphenyl)-2,6-dimethyl-5-propyl-3-pyridinecarboxamide,
4-bromo-5-butyl-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
4-bromo-N-(2,6-diethylphenyl)-2,6-dimethyl-5-(2-methylpropyl)-3-pyridinecarboxamide,
4-bromo-N-(2,6-diethylphenyl)-2,6-dimethyl-5-pentyl-3-pyridinecarboxamide,
4-bromo-N-(2,6-diethylphenyl)-2,6-dimethyl-5-(3-methylbutyl)-3-pyridinecarboxamide,
4-bromo-N-(4-bromo-2,6-diethylphenyl)-2,5,6-trimethyl-3-pyridinecarboxamide,
4-bromo-N-(4-bromo-2,6-diethylphenyl)-5-ethyl-2,6-dimethyl-3-pyridinecarboxamide,
4-bromo-N-(4-bromo-2,6-diethylphenyl)-2,6-dimethyl-5-propyl-3-pyridinecarboxamide,
4-bromo-N-(4-bromo-2,6-diethylphenyl)-5-butyl-2,6-dimethyl-3-pyridinecarboxamide,
4-bromo-N-(4-bromo-2,6-diethylphenyl)-2,6-dimethyl-5-(2-methylpropyl)-3-pyridinecarboxamide,
4-bromo-N-(4-bromo-2,6-diethylphenyl)-2,6-dimethyl-5-pentyl-3-pyridinecarboxamide,
4-bromo-N-(4-bromo-2,6-diethylphenyl)-2,6-dimethyl-5-(3-methylbutyl)-3-pyridinecarboxamide,
N-(2,6-diethylphenyl)-4-iodo-2,5,6-trimethyl-3-pyridinecarboxamide,
5-ethyl-N-(2,6-diethylphenyl)-4-iodo-2,6-dimethyl-3-pyridinecarboxamide,
N-(2,6-diethylphenyl)-4-iodo-2,6-dimethyl-5-propyl-3-pyridinecarboxamide,
5-butyl-N-(2,6-diethylphenyl)-4-iodo-2,6-dimethyl-3-pyridinecarboxamide,
N-(2,6-diethylphenyl)-4-iodo-2,6-dimethyl-2-(2-methylpropyl)-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-5-ethyl-4-iodo-2,6-dimethyl-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-4-iodo-2,6-dimethyl-5-propyl-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-5-butyl-4-iodo-2,6-dimethyl-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-4-iodo-2,6-dimethyl-5-(2-methylpropyl)-3-pyridinecarboxamide,
5-ethyl-N-(2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
N-(2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-5-propyl-3-pyridinecarboxamide,
5-butyl-N-(2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
N-(2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-5-(2-methylpropyl)-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-5-ethyl-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-5-propyl-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-5-butyl-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-5-(2-methylpropyl)-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-4-chloro-2,6-diethyl-5-(2-propynyl)-3-pyridinecarboxamide,
4-chloro-N-(2,6-diethyl-4-methylphenyl)-2,6-dimethyl-5-(2-propynyl)-3-pyridinecarboxamide,
4-chloro-N-(2,6-diethyl-4-iodophenyl)-2,6-dimethyl-5-(2-propynyl)-3-pyridinecarboxamide,
4-chloro-N-(2,6-diethyl-4-fluorophenyl)-2,6-dimethyl-5-(2-propynyl)-3-pyridinecarboxamide,
4-chloro-N-(3-bromo-4-methyl-2,6-diethylphenyl)-2,6-dimethyl-5-(2-propynyl)-3-pyridinecarboxamide,
5-allyl-N-(3-bromo-4-methyl-2,6-diethylphenyl)-4-chloro-2,6-dimethyl-3-pyridinecarboxamide,
5-(2-butenyl)-4-chloro-N-(4-chloro-2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-(2-butenyl)-N-(4-bromo-2,6-diethylphenyl)-4-chloro-2,6-dimethyl-3-pyridinecarboxamide,
5-(2-butenyl)-4-chloro-N-(2,6-diethyl-4-methylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-(2-butenyl)-4-chloro-N-(2,6-diethyl-4-fluorophenyl)-2,6-dimethyl-3-pyridinecarboxamide,
N-(3-bromo-2,6-diethyl-4-methylphenyl)-5-(2-butenyl)-4-chloro-2,6-dimethyl-3-pyridinecarboxamide,
5-(2-butenyl)-4-chloro-N-(2,6-diethyl-4-iodophenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-chloro-N-(2,6-diethyl-4-fluorophenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-bromo-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-bromo-N-(4-bromo-2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-bromo-N-(4-chloro-2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-bromo-N-(2,6-diethyl-4-methylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-bromo-N-(2,6-diethyl-4-fluorophenyl)-2,6-dimethyl-3-pyridinecarboxamide,
4-bromo-N-(2,6-diethylphenyl)-2,6-dimethyl-5-(2-propynyl) -3-pyridinecarboxamide,
4-bromo-N-(2,6-diethyl-4-fluorophenyl)-2,6-dimethyl-5-(2-propynyl)-3-pyridinecarboxamide,
4-bromo-5-(2-butenyl)-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
4-bromo-5-(2-butenyl)-N-(2,6-diethyl-4-fluorophenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-bromo-N-(3-bromo-2,6-diethyl-4-methylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(2,6-diethyl-4-fluorophenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,

N-(2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-5-(2-propynyl)-3-pyridinecarboxamide,
N-(2,6-diethyl-4-fluorophenyl)-4-fluoro-2,6-dimethyl-5-(2-propynyl)-3-pyridinecarboxamide,
5-allyl-N-(4-chloro-2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(4-bromo-2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(2,6-diethyl-4-methylphenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
5-(2-butenyl)-N-(2,6-diethylphenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(2,6-diethylphenyl)-4-iodo-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(2,6-diethyl-4-fluorophenyl)-4-iodo-2,6-dimethyl-3-pyridinecarboxamide,
N-(2,6-diethylphenyl)-4-iodo-2,6-dimethyl-5-(2-propynyl) -3-pyridinecarboxamide,
N-(2,6-diethyl-4-fluorophenyl)-4-iodo-2,6-dimethyl-5-(2-propynyl)-3-pyridinecarboxamide,
5-(2-butenyl)-N-(2,6-diethylphenyl)-4-iodo-2,6-dimethyl -3-pyridinecarboxamide,
5-allyl-4-chloro-N-(2,3-dimethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-chloro-N-(2,4-dimethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-chloro-N-(2-chlorophenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(2,3-dimethylphenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(2-chlorophenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
5-(2-butenyl)-N-(2-chlorophenyl)-4-fluoro-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(3-chloro-2-methylphenyl)-4-fluoro-2,6-dimethyl -3-pyridinecarboxamide,
5-allyl-4-chloro-N-(3-chloro-2-methylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
2-allyl-4-chloro-N-(2,6-diethylphenyl)-5,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-chloro-2,6-dimethyl-N-(2,6-dimethylphenyl)-3-pyridinecarboxamide,
5-allyl-4-chloro-N-(2-ethyl-6-methylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-N-(3-bromo-2,6-diethylphenyl)-4-chloro-2,6-dimethyl-3-pyridinecarboxamide,

This invention is illustrated further by examples hereinafter.

Physico-chemical data on Compounds obtained by Examples are shown in Tables 1 and 2.

Growth-regulating activities on plants of the compounds of the invention are shown in Table 3.

Furthermore, the evaluation method growth regulating activity is as follows;

A carrier was prepared by mixing 50 parts (by weight) of talc, 25 parts of bentonite, 2 parts of Solpole-9047 (Toho Chemical Co., Ltd, Japan) and 3 parts of Solpole-5039 (Toho Chemical Co., Ltd, Japan). 50 parts of a test compound and 200 parts of the carrier were mixed to obtain 20% wettable powder, followed by dispersing the powder in distilled water to make a dispersion of the definite concentrations.

Seeds of Oryza sativa L., Echinochloa crus-galli L., and Raphanus sativus L. were germinated in a laboratory dish, to which the dispersion was added. After breeding for 7 days in a thermostatic box kept at 25 • C under illumination of fluorescent tubes, growth of plant was observed.

In the column of "Evaluation" of Table 3, the designation 1 denotes no influence, 2 denotes 25% growth inhibition, 3 denotes 50% growth inhibition, 4 denotes 75% growth inhibition and 5 denotes 100% growth inhibition.

Example 1

5-Allyl-4-chloro-N-(2,6-diethyl-4-methylphenyl)-2,6-dimethyl-3-pyridinecarboxamide (Method A)

A mixture of 0.85 g (2.41 m mol) of 5-allyl-N-(2,6-diethyl-4-methylphenyl)-1,4-dihydro-2,6-dimethyl-4-oxo-3-pyridinecarboxamide and 5 ml of phosphorus oxychloride was heated under reflux for an hour. An excess of phosphorus oxychloxide was removed under vacuo, and the residue was dissolved in 100 ml of methylene chloride. Then the resulting solution was added into 150 ml of saturated sodium bicarbonate solution, followed by stirring for an hour at room temperature. The organic layer was washed with water, dried and concentrated by the conventional method. The resulted crystalline residue was recrystallized from ethyl acetate to give 0.84 g of the title compound, m.p. 192.5 - 194 • C.

Examples 2 - 55

Compounds were obtained by the method as described in the column "Method" of Table 1. Their physico-chemical data are shown in Tables 1 and 2, and their growth-regulating activities on plants are shown in Table 3.

Table 1

Example No.	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8	X	mp (°C)	Method
1	CH_3	C_2H_5	H	CH_3	H	C_2H_5	CH_2=CH-CH_2-	CH_3	Cl	192.5-194	A
2	"	"	"	H	"	"	"	"	"	200-204.5	"
3	"	"	"	Cl	"	"	"	"	"	145.5-148	"
4	"	"	"	Br	"	"	"	"	"	201-203	"
5	"	"	"	H	"	"	HC≡C-CH_2-	"	"	242-244	"
6	"	"	"	I	"	"	"	"	"	222-224	A
7	"	"	"	Br	"	"	n-C_4H_9	"	Cl	228.5-229	A
8	"	H	"	H	"	H	H	"	"	157-158	"
9	"	CH_3	CH_3	"	"	"	C_2H_5	"	"	193-197	"
10	"	C_2H_5	H	"	"	C_2H_5	H	"	"	210.5-215	"
11	"	"	"	"	"	"	CH_3	"	"	222-229.5	"
12	"	"	"	"	"	"	C_2H_5	"	"	232-232.5	"
13	"	"	"	"	"	"	n-C_3H_7	"	"		"
14	"	"	"	"	"	"	iso-C_4H_9	"	"	162-164.5	"

Table 1 (continued)

Example No.	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8	X	mp (°C)	Method
15	CH_3	C_2H_5	H	H	H	C_2H_5	iso-C_5H_{11}	CH_3	Cl	196.5-198	A
16	"	"	"	"	"	"	Br	"	"		"
17	"	"	"	"	"	"	Ph	"	"	210-211	"
19	C_2H_5	"	"	"	"	"	CH_3	"	"		"
20	n-C_3H_7	"	"	"	"	"	H	"	"		"
21	"	"	"	"	"	"	CH_3	"	"		"
22	n-C_4H_9	"	"	"	"	"	H	"	"		"
23	"	"	"	"	"	"	Br	"	"		"
24	CH_3	"	"	"	"	"	CH_3	C_2H_5	"	244-246	"
25		H	"	"	"	H	H	CH_3	"	191-192	"
26	CH_3	C_2H_5	"	"	"	C_2H_5	$-(CH_2)_4-$		"	214-216	"
27	"	"	"	Br	"	"	CH_3	CH_3	"	277.5-279	"
28	"	"	"	"	"	"	C_2H_5	"	"	244.5-246	"
29	"	"	"	"	"	"	C_3H_7	"	"	206.5-209	"

Table 1 (continued)

Example No.	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8	X	mp (°C)	Method
30	CH_3	C_2H_5	H	H	H	C_2H_5	C_4H_9	CH_3	Cl		A
31	"	"	"	Br	"	"	iso-C_4H_9	"	"		"
32	"	"	"	"	"	"	iso-C_5H_{11}	"	"	201-201.5	"
33	n-C_3H_7	"	"	"	"	"	CH_3	"	"		"
34	n-C_4H_9	"	"	"	"	"	C_2H_5	"	"		"
35	Ph	"	"	H	"	"	H	"	Br		"
36	"	"	"	"	"	"	n-C_3H_7	"	"		A
37	"	"	"	"	"	"	C_2H_5	"	"		"
38	CH_3	"	"	"	"	"	-$(CH_2)_3$-		"	233-234.5	"
39	"	"	Br	CH_3	"	"	CH_2=CH-CH_2-	CH_3	"	204.5-205.5	A
40	"	"	H	Cl	"	"	n-C_3H_7	"	"	198-200	"
43	"	"	"	F	"	"	CH_2=CH-CH_2-	CH_3	"		"

Table 1 (continued)

Example No.	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8	X	mp (°C)	Method
44	CH_3	C_2H_5	H	F	H	C_2H_5	iso-C_4H_9	CH_3	Cl	172.5-174	A
45 *	"	"	"	H	"	"	CH_2=CH-CH_2-	"	"	200.5-201	"
46	"	"	"	"	"	"	CH_2=$CHCH_2CH_2$-	"	"	181-185	"
47	"	"	"	"	"	"	CH_3CH=$CHCH_2$-	"	"	198-201	"
48	"	"	"	"	"	"	CH_2=$C(CH_3)CH_2$-	"	"		"
49	"	"	"	"	"	"	$(CH_3)_2C$=$CHCH_2$-	"	"	166-173.5	"

* : hydrochloride salt

Table 2

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
1	1643, 1650	KBr	1.22(t,6H), 2.33(s,3H), 2.55(s,3H), 2.63(s,3H), 2,70(q,4H), 3.53(d,2H), 4.73-5.20(m,2H), 5.50-6.17(m,1H), 6.93(s,2H), 7.10(br,1H)	$CDCl_3$
2	1655	"	1.22(t,6H), 2.55(s,3H), 2.63(s,3H), 2.76(q,4H), 3.55(d,2H), 4.76-5.23 (m,2H), 5.50-6.23(m,1H), 7.14 (s,3H), 7.22(br,1H)	"
3	1638	"	1.10(t,6H), 2.50(s,6H), 2.57(q,4H), 3.43(d,2H), 4.68-5.17(m,2H), 5.40-6.10(m,1H), 6.97(s,2H), 7.85(br,1H)	"
4	1647, 1653	"	1.18(t,6H), 2.54(s,3H), 2.58(s,3H), 2.70(q,4H), 3.52(d,2H), 4.73-5.29 (d,2H), 5.47-6.20(m,1H), 7.26 (br,4H)	"
5	1650	"	1.22(t,6H), 2.28(t,1H), 2.67(s,6H), 2.76(q,4H), 3.70(q,2H), 7.10(s,3H), 9.68(br,1H)	$CDCl_3$ -DMSO-d_6

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
6	1650	"	1.17(t,6H), 2.52(s,3H), 2.57(s,3H), 2.65(q,4H), 2.50(d,2H), 4.65-5.25 (m,2H), 5.30-6.20(m,1H), 7.10 (br,1H), 7.39(s,2H)	"
7	1647	"	0.70-1.75(m,4H), 1.08(t,3H), 1.20 (t,6H), 2.56(s,3H), 2.60(s,3H), 2.40-3.00(m,6H), 7.20(s,2H), 9.43 (br,1H)	"
8	1653	"	2.50(s,3H), 2.56(s,3H), 7.00(s,1H), 7.07-7.13(m,5H), 7.87(br,1H)	"
9	1653	"	1.15(t,3H), 2.20(s,3H), 2.30(s,3H), 2.57(s,6H), 2.78(q,2H), 7.00-7.67 (m,4H)	"

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
10	1653	KBr	1.21(t,6H), 2.50(s,3H), 2.67(s,3H), 2.73(q,4H), 7.00-7.33(m,5H)	$CDCl_3$
11	1650	"	1.00(t,6H), 2.12(s,3H), 2.32(s,3H), 2.37(s,3H), 2.47(q,4H), 6.85-7.30 (m,3H), 8.06(br,1H)	"
12	1650	"	1.16(t,3H), 1.21(t,6H), 2.60(s,3H), 2.66(s,3H), 2.80(q,4H), 2.86(q,2H), 7.13(br,1H), 7.20(s,3H)	"
13	1655	"	0.80-1.90(m,5H), 1.18(t,6H), 2.40-2.95(m,6H), 2.55(s,3H), 2.57(s,3H), 7.13(s,3H), 7.30(br,1H)	"
14	1650, 1655	"	0.97(d,6H), 1.21(t,6H), 2.07(sep, 1H), 2.53-3.07(m,6H), 2.56(s,3H), 2.63(s,3H), 7.00-7.40(m,4H)	"

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
15	1655	KBr	0.70-1.90(m,3H), 0.97(d,6H), 1.19 (t,6H), 2.53(s,3H), 2.57(s,3H), 2.40-3.00(m,6H), 7.13(m,4H)	$CDCl_3$
16	1650	"	1.20(t,6H), 2.62(s,3H), 2.68(s,3H), 2.73(q,4H), 7.08(s,3H), 9.53(br,1H)	$CDCl_3$ -DMSO-d_6
17	1640	"	1.18(t,6H), 2.28(s,3H), 2.70(s,3H), 2.75(q,4H), 6.90-7.80(m,9H)	$CDCl_3$
19	1647	"	1.22(t,6H), 1.30(t,3H), 2.34(s,3H), 2.56(s,3H), 2.76(q,4H), 2.90(q,2H), 7.00(br,1H), 7.16(s,3H)	"

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
20	1650	KBr	0.95(t,3H), 1.19(t,6H), 1.76(six, 2H), 2.49(s,3H), 2.40-3.10(m,6H), 7.00(s,1H), 7.10(br,1H), 7.16 (s,3H)	$CDCl_3$
21	1643	"	0.92(t,3H), 1.13(t,6H), 1.73(six, 2H), 2.26(s,3H), 2.47(s,3H), 2.50-3.00(m,6H), 7.00-7.17(m,3H), 7.35 (br,1H)	"
22	1643	"	0.93(t,3H), 0.70-2.00(m,4H), 1.24 (t,6H), 2.53(s,3H), 2.79(q,4H), 2.98(t,2H), 7.00(br,1H), 7.08 (s,1H), 7.18(s,3H)	"
23	1655	"	0.70-2.10(m,4H), 0.95(t,3H), 1.25 (t,6H), 2.72(s,3H), 2.60-3.10 (m,6H), 6.97(br,1H), 7.13(s,3H)	"
24	1650	"	1.21(t,6H), 1.24(t,3H), 2.36(s,3H), 2.63(s,3H), 2.76(q,4H), 2.84(q,2H), 6.90-7.35(m,4H)	"

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
25	1673	KBr	2.50(s,3H), 6.90-7.80(m,10H), 8.27(br,1H)	$CDCl_3$
26	1647	"	1.19(t,6H), 1.60-2.10(m,4H), 2.50-3.10(m,8H), 2.68(s,3H), 7.14(s,3H), 7.77(br,1H)	"
27	1650	"	1.21(t,6H), 2.34(s,3H), 2.50(s,3H), 2.60(s,3H), 2.70(q,4H), 7.18(s,2H), 9.12(br,1H)	"
28	1652	"	1.11(t,3H), 1.17(t,6H), 2.55(s,6H), 2.45-3.03(m,6H), 7.23(br,3H)	"
29	1640	"	0.80-1.80(m,5H), 1.17(t,6H), 2.40-3.00(m,6H), 2.53(s,3H), 2.59(s,3H), 7.18(s,2H), 8.92(br,1H)	"

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
30	1650	KBr	0.70-1.80(m,7H), 1.19(t,6H), 2.40-3.00(m,6H), 2.57(s,3H), 2.65(s,3H), 7.13(s,3H), 7.86(br,1H)	$CDCl_3$
31	1650	"	0.95(d,6H), 1.17(t,6H), 1.60-3.00 (m,7H), 2.60(s,6H), 7.24(s,2H), 8.07(br,1H)	"
32	1655	"	0.80-2.00(m,5H), 0.98(d,6H), 1.19 (t,6H), 2.40-2.95(m,6H), 2.53 (s,3H), 2.56(s,3H), 7.10(br,1H) 7.22(s,2H)	"
33	1653	"	0.98(t,3H), 1.20(t,6H), 1.75(six, 2H), 2.30(s,3H), 2.49(s,3H), 2.50-2.93(m,6H), 7.13(s,2H), 9.13(br, 1H)	$CDCl_3$ -DMSO-d_6
34	1650	"	0.70-2.10(m,10H), 1.20(t,6H), 2.50-3.10(m,8H), 2.56(s,3H), 7.00(br,1H), 7.27(s,2H)	$CDCl_3$

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
35	1648	KBr	0.94(t,6H), 2.15(q,4H), 2.59(s,3H), 6.75(br,1H), 6.80-7.80(m,8H)	$CDCl_3$
36	1652	"	0.70-2.00(m,2H), 1.02(t,3H), 1.17 (t,6H), 1.26(t,3H), 2.54(s,3H), 2.20-3.10(m,8H), 6.85-7.40(m,4H)	"
37	1643	"	1.09(t,3H), 1.22(t,6H), 1.30(t,3H), 2.57(s,3H), 2.30-3.20(m,8H), 6.80-7.40(m,4H)	"
38	1650	"	1.14(t,6H), 1.75-2.40(m,2H), 2.40-3.25(m,8H), 2.54(s,3H), 6.85-7.35 (m,3H), 7.47(br,1H)	"

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
39	1648	KBr	1.08(t,3H), 1.13(t,3H), 2.30-3.20 (m,4H), 2.39(s,3H), 2.50(s,3H), 2.55(s,3H), 3.47(d,2H), 4.70-5.23 (m.2H), 5.45-6.15(m,1H), 6.97 (s,1H), 7.42(br,1H)	$CDCl_3$
40	1642	"	1.03(t,3H), 1.20(t,6H), 1.30-2.00 (m,2H), 2.35-3.10(m,2H), 2.54 (s,3H), 2.57(s,3H), 2.70(q,4H), 6.85-7.30(m,3H)	"
43	1648	"	1.17(t,6H), 2.52(s,3H), 2.56(s,3H), 2.68(q,4H), 3.50(d,2H), 4.70-5.20 (m,2H), 5.50-6.20(m,1H), 6.78 (d,2H), 7.23(br,1H)	$CDCl_3$

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
44	1640	KBr	0.97(d,6H), 1.22(t,6H), 1.50-2.50 (m,1H), 2.55(s,3H), 2.62(s,3H), 2.40-3.00(m,6H), 6.78(d,2H), 6.93(br,1H)	$CDCl_3$
45	1680, 1950, 2450	"	1.22(t,6H), 2.75(q,4H), 2.76(s,3H), 2.97(s,3H), 3.58(d,2H), 4.75-5.30 (m,2H), 5.40-6.10(m,1H), 6.85-7.30 (m,3H), 9.84(br,1H)	"
46	1650	"	1.21(t,6H), 1.95-3.20(m,4H), 2.57 (s,3H), 2.63(s,3H), 2.75(q,4H), 4.70-5.30(m,2H), 5.30-6.30(m,1H), 6.90-7.50(m,4H)	"
47	1650	"	1.19(t,6H), 1.50-1.90(m,3H), 2.53 (s,3H), 2.58(s,3H), 2.73(q,4H), 3.25-3.60(m,2H), 5.20-5.60(m,2H), 6.85-7.45(m,4H)	"
48	1640	"	1.17(t,6H), 1.81(s,3H), 2.47(s,3H), 2.57(s,3H), 2.73(q,4H), 3.41(br, 2H), 4.28(br, 1H), 4.60-4.85(m,1H), 6.85-7.40(m,3H), 7.23(br ,1H)	"

Table 2 (continued)

Example No.	I R		N M R	
	ν-value (cm^{-1})	Method	Chemical shift δ value	Solvent
49	1653	KBr	1.20(t,6H), 1.74(d,6H), 2.52(s,3H), 2.59(s,3H), 2.72(q,4H), 3.44(d,2H), 4.50-5.20(m,1H), 6.85-7.35(m,4H)	$CDCl_3$

Table 3

Example No.	Evaluation			
	Conc. (ppm)	Plants		
		X	Y	Z
1	20	5	5	5
	100	5	5	5
2	20	5	5	5
	100	5	5	5
3	20	5	5	5
	100	5	5	5
4	20	5	5	5
	100	5	5	5
5	20	5	5	5
	100	5	5	5
6	20	5	5	5
	100	5	5	5
7	20	5	5	5
	100	5	5	5
8	20	5	5	5
	100	5	5	5
9	20	5	5	5
	100	5	5	5

Table 3 (continued)

Example No.	Evaluation			
	Conc. (ppm)	Plants		
		X	Y	Z
10	20	5	5	5
	100	5	5	5
11	20	5	5	5
	100	5	5	5
12	20	5	5	5
	100	5	5	5
13	20	5	5	5
	100	5	5	5
14	20	5	5	5
	100	5	5	5
15	20	4	5	5
	100	5	5	5
16	20	3	4	4
	100	4	5	5
17	20	1	1	2
	100	2	2	3
19	20	5	5	5
	100	5	5	5

Table 3 (continued)

Example No.	Evaluation			
	Conc. (ppm)	Plants		
		X	Y	Z
20	20	5	5	5
	100	5	5	5
21	20	5	5	5
	100	5	5	5
22	20	3	5	1
	100	4	5	2
23	20	4	5	4
	100	5	5	5
24	20	1	4	1
	100	1	4	1
25	20	4	5	5
	100	5	5	5
26	20	4	5	5
	100	5	5	5
27	20	5	5	5
	100	5	5	5
28	20	4	5	4
	100	5	5	5
29	20	4	5	5
	100	5	5	5

Table 3 (continued)

Example No.	Evaluation			
	Conc. (ppm)	Plants		
		X	Y	Z
30	20	4	4	3
	100	5	5	4
31	20	2	5	1
	100	3	5	2
32	20	5	5	4
	100	5	5	5
33	20	5	5	5
	100	5	5	5
34	20	5	5	5
	100	5	5	5
35	20	5	5	5
	100	5	5	5
36	20	5	5	4
	100	5	5	5
37	20	5	5	5
	100	5	5	5
38	20	5	5	5
	100	5	5	5

Table 3 (continued)

Example No.	Evaluation			
	Conc. (ppm)	Plants		
		X	Y	Z
39	20	5	5	5
	100	5	5	5
40	20	5	5	5
	100	5	5	5

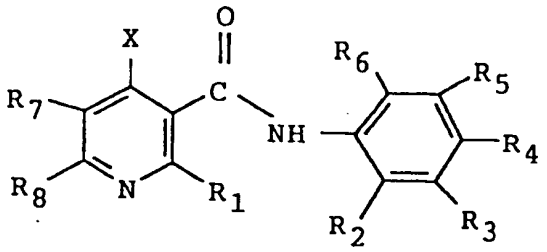
X : Oryza sativa L.

Y : Echinochloa crus-galli L.

Z : Raphanus sativus L.

Claims

1. A compound of the formula

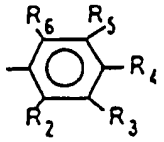


wherein R_1 is a C_{1-5} alkyl or a phenyl optionally substituted by a halogen,
R_2-R_6 is a C_{1-5} alkyl, a hydrogen or a halogen,
R_7 is a hydrogen, a halogen, a C_{1-5} alkyl, a C_{2-6} alkenyl, a C_{2-6} alkynyl or a phenyl,
R_8 is a C_{1-5} alkyl, or R_7 and R_8 may be combined to form a group of - $(CH_2)_m$ - (m is 3 or 4),
X is a halogen.

2. A compound of claim 1 wherein X is chlorine atom.

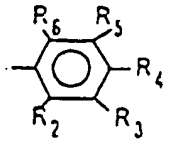
3. A compound of claim 1 wherein X is bromine atom..

4. A compound of claim 1 wherein



in the formula (I) is 2,6-diethylphenyl or 4-bromo-2,6-diethylphenyl.

5. A compound of claim 1 wherein



in the formula (I) is 4-chloro-2,6-diethylphenyl, or 2,6-diethyl-4-fluorophenyl.

6. A compound of claim 1 wherein R_1 and R_8 are methyl.

7. A compound of claim 1 wherein R_7 is ethyl, propyl, isobutyl, isopentyl, 2-butenyl, 3-butenyl, 2-methyl-2-propenyl, 3-methyl-2-butenyl, allyl or 2-propynyl.

8. A compound of claim 1 wherein X is fluorine atom.

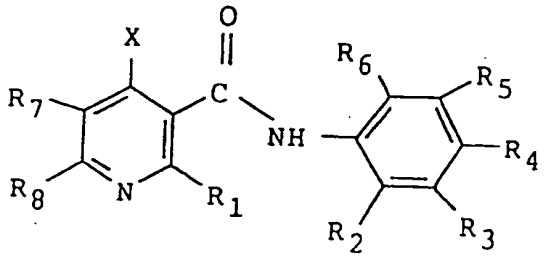
9. A compound of claim 1 wherein X is iodine atom.

10. A compound of claim 1 which is:
4-chloro-5-ethyl-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
4-chloro-N-(2,6-diethylphenyl)-2,6-dimethyl-5-propyl-3-pyridinecarboxamide,
5-butyl-4-chloro-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
4-chloro-N-(2,6-diethylphenyl)-2,6-dimethyl-5-(2-methylpropyl)-3-pyridinecarboxamide,
4-chloro-N-(2,6-diethylphenyl)-2,6-dimethyl-5-(3-methylbutyl)-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-4-chloro-2,6-dimethyl-5-propyl-3-pyridinecarboxamide,
N-(4-bromo-2,6-diethylphenyl)-4-chloro-2,5,6-trimethyl-3-pyridinecarboxamide,
5-allyl-4-chloro-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-chloro-N-(4-chloro-2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-chloro-N-(2,6-diethyl-4-methylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
5-allyl-4-chloro-N-(4-bromo-2,6-diethylphenyl)-2,6-dimethyl-3-pyridinecarboxamide,
4-chloro-N-(2,6-diethylphenyl)-2,6-dimethyl-5-(2-propynyl)-3-pyridinecarboxamide,
5-allyl-4-chloro-N-(2,6-diethyl-4-iodophenyl)-2,6-dimethyl-3-pyridinecarboxamide or
5-allyl-4-chloro-N-(2,6-diethyl-4-fluorophenyl)-2,6-dimethyl-3-pyridinecarboxamide.

11. A herbicidal composition which comprises at least one kind of the compounds as defined in any of claims 1 - 10.

Patentansprüche

1. Verbindung der Formel

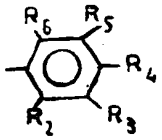


worin R_1 für einen C_{1-5}-Alkyl- oder einen Phenylrest, der gegebenenfalls durch ein Halogenatom substituiert ist, steht,
R_2-R_6 für einen C_{1-5}-Alkylrest, ein Wasserstoff- oder ein Halogenatom steht,
R_7 für ein Wasserstoffatom, ein Halogenatom, einen C_{1-5}-Alkyl-, einen C_{2-6}-Alkenyl-, einen C_{2-6}-Alkynyl- oder einen Phenylrest steht,
R_8 für einen C_{1-5}-Alkylrest steht, oder R_7 und R_8 zur Bildung einer Gruppe - $(CH_2)_m$ - (m = 3 oder 4) kombiniert sein können,
X ein Halogenatom ist.

2. Verbindung nach Anspruch 1, dadurch **gekennzeichnet**, daß X ein Chloratom ist.

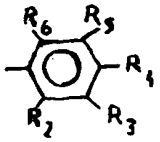
3. Verbindung nach Anspruch 1, dadurch **gekennzeichnet**, daß X ein Bromatom ist.

4. Verbindung nach Anspruch 1, dadurch **gekennzeichnet**, daß



in der Formel (I) 2,6-Diethylphenyl oder 4-Brom-2,6-diethylphenyl ist.

5. Verbindung nach Anspruch 1, dadurch **gekennzeichnet**, daß



in der Formel (I) 4-Chlor-2,6-diethylphenyl oder 2,6-Diethyl-4-fluorphenyl ist.

6. Verbindung nach Anspruch 1, dadurch **gekennzeichnet**, daß R_1 und R_8 Methyl sind.

7. Verbindung nach Anspruch 1, dadurch **gekennzeichnet**, daß R_7 Ethyl, Propyl, Isobutyl, Isopentyl, 2-Butenyl, 3-Butenyl, 2-Methyl-2-propenyl, 3-Methyl-2-butenyl, Allyl oder 2-Propynyl ist.

8. Verbindung nach Anspruch 1, dadurch **gekennzeichnet**, daß X ein Fluoratom ist.

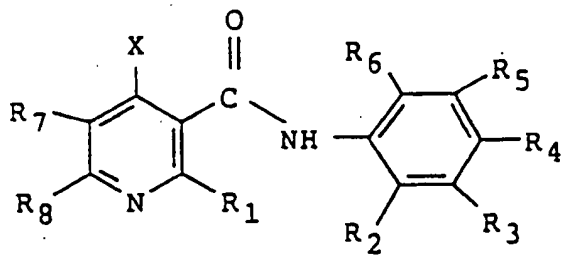
9. Verbindung nach Anspruch 1, dadurch **gekennzeichnet**, daß X ein Iodatom ist.

10. Verbindung nach Anspruch 1, nämlich:
4-Chlor-5-ethyl-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridincarboxamid,
4-Chlor-N-(2,6-diethylphenyl)-2,6-dimethyl-5-propyl-3-pyridincarboxamid,
5-Butyl-4-chlor-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridincarboxamid,
4-Chlor-N-(2,6-diethylphenyl)-2,6-dimethyl-5-(2-methylpropyl)-3-pyridincarboxamid,
4-Chlor-N-(2,6-diethylphenyl)-2,6-dimethyl-5-(3-methylbutyl)-3-pyridincarboxamid,
N-(4-Brom-2,6-diethylphenyl)-4-chlor-2,6-dimethyl-5-propyl-3-pyridincarboxamid,
N-(4-Brom-2,6-diethylphenyl)-4-chlor-2,5,6-trimethyl-3-pyridincarboxamid,
5-Allyl-4-chlor-N-(2,6-diethylphenyl)-2,6-dimethyl-3-pyridincarboxamid,
5-Allyl-4-chlor-N-(4-chlor-2,6-diethylphenyl)-2,6-dimethyl-3-pyridincarboxamid,
5-Allyl-4-chlor-N-(2,6-diethyl-4-methylphenyl)-2,6-dimethyl-3-pyridincarboxamid,
5-Allyl-4-chlor-N-(4-brom-2,6-diethylphenyl)-2,6-dimethyl-3-pyridincarboxamid,
4-Chlor-N-(2,6-diethylphenyl)-2,6-dimethyl-5-(2-propynyl)-3-pyridincarboxamid,
5-Allyl-4-chlor-N-(2,6-diethyl-4-iodphenyl)-2,6-dimethyl-3-pyridincarboxamid, oder
5-Allyl-4-chlor-N-(2,6-diethyl-4-fluorphenyl)-2,6-dimethyl-3-pyridincarboxamid.

11. Herbizide Zusammensetzung, dadurch **gekennzeichnet**, daß sie mindestens eine Art der Verbindungen nach den Ansprüchen 1 bis 10 umfaßt.

Revendications

1. Composé représenté par la formule (I):



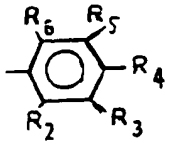
(I)

dans laquelle :
R_1 est un groupe alkyle en C_{1-5} ou un groupe phényle éventuellement substitué par un atome d'halogène;
R_2 à R_6 sont chacun un groupe alkyle en C_{1-5}, un atome d'hydrogène ou d'halogène,
R_7 est un atome d'hydrogène ou d'halogéne, un groupe alkyle en C_{1-5}, alcényle en C_{2-6}, alcynyle en C_{2-6} ou un groupe phényle,
R_8 est un groupe alkyle en C_{1-5}, ou bien R_7 et R_8 peuvent être combinés pour former un groupe $-(CH_2)_m-$, dans lequel m est 3 ou 4,
X est un atome d'halogène.

2. Composé suivant la revendication 1, dans lequel X est un atome de chlore.

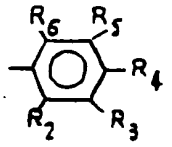
3. Composé suivant la revendication 1, dans lequel X est un atome de brome.

4. Composé suivant la revendication 1, dans lequel



dans la formule (I), est un groupe 2,6-diéthylphényle ou 4-bromo-2,6-diéthylphényle.

5. Composé suivant la revendication 1, dans lequel



dans la formule (I), est un groupe 4-chloro-2,6-diéthylphényle ou 4-fluoro-2,6-diéthylphényle.

6. Composé suivant la revendication 1, dans lequel R_1 et R_8 sont chacun un groupe méthyle.

7. Composé suivant la revendication 1, dans lequel R_7 est un groupe éthyle, propyle, isobutyle, isopentyle, 2-buténye, 3-buténye, 2-méthyl-2-propényle, 3-méthyl-2-buténye, allyle ou 2-propynyle.

8. Composé suivant la revendication 1, dans lequel X est un atome de fluor.

9. Composé suivant la revendication 1, dans lequel X est un atome d'iode.

10. Composé suivant la revendication 1, qui est
le 4-chloro-5-éthyl-N-(2,6-diéthylphényl)-2,6-diméthyl-3-pyridine carboxamide,
le 4-chloro-N-(2,6-diéthylphényl)-2,6-diméthyl-5-propyl-3-pyridine carboxamide,
le 4-chloro-5-butyl-N-(2,6-diéthylphényl)-2,6-diméthyl-3-pyridine carboxamide,
le 4-chloro-N-(2,6-diéthylphényl)-2,6-diméthyl-5-(2-méthylpropyl)-3-pyridine carboxamide,
le 4-chloro-N-(2,6-diéthylphényl)-2,6-diméthyl-5-(3-méthylpropyl)-3-pyridine carboxamide,
le N-(4-bromo-2,6-diéthylphényl)-4-chloro-2,6-diméthyl-5-propyl-3-pyridine carboxamide,
le N-(4-bromo-2,6-diéthylphényl)-4-chloro-2,5,6-triméthyl-5-propyl-3-pyridine carboxamide,
le 4-chloro-5-allyl-N-(2,6-diéthylphényl)-2,6-diméthyl-3-pyridine carboxamide,
le 4-chloro-5-allyl-N-(4-chloro-2,6-diéthylphényl)-2,6-diméthyl-3-pyridine carboxamide,
le 4-chloro-5-allyl-N-(2,6-diéthyl-4-méthylphényl)-2,6-diméthyl-3 pyridine carboxamide,
le 4-chloro-5-allyl-N-(4-bromo-2,6-diéthylphényl)-2,6-diméthyl-3-pyridine carboxamide,
le 4-chloro-N-(2,6-diéthylphényl)-2,6-diméthyl-5-(2-propynyl)-3-pyridine carboxamide,
le 4-chloro-5-allyl-N-(2,6-diéthyl-4-iodophényl)-2,6-diméthyl-3-pyridine carboxamide, ou
le 4-chloro-5-allyl-N-(2,6-diéthyl-4-fluorophényl)-2,6-diméthyl-3-pyridine carboxamide.

11. Composition herbicide, qui comprend au moins un type des composés suivant l'une quelconque des revendications 1 à 10.